Hand Washing in Healthcare Workers — A Challenge That Can Be Met?

The hands of health care workers (HCW) are the main source of hospital infection, and therefore hand washing is the most important procedure for preventing nosocomial infections. Hygienic hand disinfection by hospital personnel to remove the transient contaminating bacteria is widely encouraged for infection control.1

Pathogens responsible for nosocomial infection are transmitted from patient to patient by the hands of HCW.2

Despite evidence for the importance of hand washing in the prevention of nosocomial infection, studies have demonstrated that compliance with this fundamental control remains low in patient care setting.3

The purpose of this study was to examine the frequency and duration of hand washing practices in HCW in a tertiary hospital setting (GBPH, New Delhi). Data regarding hand washing practices by 100 HCW including doctors (50), nurses (25) and safai karamcharis (25) was collected by questionnaire method. In GBPH, there is a wash basin with soap and water at the end of each ward. At the nursing station and in the operation theatres and ICU’S in addition to the above, liquid disinfectant [Ethyl hexadecyl ethyl sulphate etc.] and a alcoholic rub[Chlorhexidine gluconate etc.] is also available, however these facilities are not available on bedside. The above information was analyzed. All the HCWs included in this study were in good health with undamaged skin and none of the subjects were on antibiotic therapy.

Different rate of compliance were found in the different categories of HCW. 60% of the doctors followed by 40% of the nurses washed their hands before examining / touching the patients. Safai karamcharis had the poorest performance — only 20% washed their hands before working.

There was no significant difference in the compliance in all the areas. This showed that the facilities provided did not contribute to any change in the compliance. However all the HCW’s washed their hands after touching the patients or after working. Doctors used soap / disinfectants most regularly (60%) followed by nurses (40%) and safai karamcharis (20%). When assessed for their practice of wearing gloves 80% of the safai karamchari wore gloves more irregularly (40%).

HCW are more likely to wash their hands after patient care than before. Thompson et al4 reported no compliance before the treatment of patients, and 63% compliance after treatment. The present study also showed such a difference. There is therefore a clear need for better research to test the effectiveness and cost-effectiveness of intervention aimed at improving hand washing.

We therefore attempted to promote hand hygiene in HCWs by implementing a hospital-wide programme: -

A hospital infection control committee with multidisciplinary team, comprising of senior nurses, doctors and administrative managers were recruited, who visit regularly the various high risk areas of institution to educate and monitor hand hygiene in various groups of HCWs.

The team also ensured the regular availability of soaps, detergents and disinfectants.

- Colorful posters were put up in ICUs, OTs and wards to emphasize the importance of hand washing.
- Regular meetings are held (4-5/year) to review hand hygiene; infection control and waste management.
- Importantly, members actively promoted hand washing in their departments.
- Efforts showed sustained improvement in hand hygiene compliance.

We conclude that studies should monitor the intervention on hand washing behavior and the rate of hospital associated infections.

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A Potential For Interactions Between Indigenous and Prescription Drugs

The Indian culture is rich in indigenous drugs. People have faith in a general notion that indigenous drugs are relatively harmless, which of course, has to be judged on a case-to-case basis. In our society, indigenous drugs are, not only used, but sometimes overused and often their use is combined with prescription chemical drugs. On the other hand, the physicians do not know about the concurrent use of indigenous drugs with prescription drugs. Generally, the use of indigenous drugs is neither inquired in the drug history while making diagnosis nor are the patients advised to avoid such an indiscriminate concurrent use of drugs. Sometimes these factors can lead to either, a therapeutic failure or, a drug interaction or, an accentuation of the known toxicities of the chemical prescription drugs.

Liquorice (Glycyrrhiza glabra) - a common household
treatment for chronic cough, sore throat, gastritis etc. has active principles with a steroid-like structure and which possess mineralocorticoid activity in large doses. The chronic overuse of this agent or its derivatives have been reported to produce reversible hypertension, heart failure, oedema and hypokalaemia. The initial step in the management of these disorders is to stop the use of liquorice immediately besides, institution of proper drug therapy, otherwise, the chances of drug interactions or, therapeutic failure are there.

Hypoglycemia has been sometimes reported in a diabetic patient even with a minimal dose of oral hypoglycemic drug. In one such case, proper dietary history of the patient has revealed that ‘Karela fruit juice’ (Momordica charantia) was also being taken as self-treatment concurrently with chlorpropamide. Hypoglycemic action of Karela has been reported in the various experimental trials. The resultant hypoglycemia of such an interaction was due to an additive synergism in the pharmacological actions of Karela and chlorpropamide. The other indigenous agents which can also interact with oral hypoglycemic drugs and produce hypoglycemia include some Ayurvedic plants Jamun (Eugenia jambolana), Fenugreek (Trigonella foenum-graceum), Tulsi (Ocimum sanctum), Holybasil (Ocimum album), Chirayata (Swertia chirata), Guargum (Cynamopsis tetragonolobus), Isapgula husk (Plantago ovata), Ghinkanvar (Aloe vera) etc. Thus, it is essential to advise the diabetic patients on oral hypoglycemic drugs to avoid the unsupervised concurrent self-treatment with these indigenous drugs to prevent hypoglycemia.

Isapgula husk is a well known household remedy for diverse bowel disorders. In a clinical trial, the chronic use of this agent in adolescent girls has produced a reduction in plasma levels of iron and calcium by promoting their urinary excretion. Thus, in patient with iron deficiency anaemia and osteoporosis, it is essential to advise the patients to avoid the chronic use of isapgula husk to ensure therapeutic success of the supplemental therapy.

Garlic (Allium sativum) a scientifically proven remedy for hyper-cholesterolemia has also shown anticoagulant effect and enhanced fibrinolytic activity in the various clinical trials. Additive pharmacological actions of garlic and aspirin or, anticoagulants may lead to bleeding. Thus, it is essential to advise the patients on oral-anticoagulants and low dose aspirin to avoid unsupervised self-treatment with garlic.

Antiepileptic drugs like phenytoin, carbamazepine, sodium valproate etc. have a narrow margin of safety. Any alterations in their pharmacokinetics can therefore result in loss of seizure control or toxicity. An unexpected loss of seizure control, accompanied by a reduction in plasma phenytoin levels, was observed in two epileptic patients. Detailed history revealed co-administration with phenytoin of an Ayurvedic preparation ‘Shankhapushpi’. An experimental trial has further confirmed that Shankhapushpi co-administration reduced the plasma phenytoin levels as well as the antiepileptic activity of phenytoin. Septilin (an Ayurvedic drug for inflammatory disorders and bacterial infection) co-administration with carbamazepine reduced carbamazepine (CBZ) plasma concentrations during the absorption phase. Ginkgo biloba (an Ayurvedic drug for diabetes mellitus related circulatory disorders, dementia, impotence etc.) co-administration with CBZ and sodium valproate reduced the plasma levels of these drugs. Caffeine intake has been shown to increase the plasma half-life (two-fold) and reduce the bioavailability by 32% of CBZ in normal human volunteers. Grapefruit juice resulted in significantly high peak, trough concentration and AUC of CBZ probably by inhibiting CYP3A4 enzyme in gut wall and liver. Thus, it is essential to advise epileptic patients to avoid unsupervised concurrent use of Shankhapushpi with phenytoin, Septilin with CBZ, Ginkgo biloba with both CBZ and sodium valproate. The epileptic patients on CBZ should also be advised to restrict the use of caffeine/xanthine and grapefruit juice.

Fenugreek is a scientifically proven remedy for diabetes mellitus and it reduces insulin resistance. There is an experimental evidence that Fenugreek powder became ineffective in both normal and diabetic rats on concurrent administration of rifampicin suggesting that in clinical trials with use of Fenugreek the caution may be applied while using rifampicin in diabetic patients.

Like drug-drug interactions, inter-system drug interactions sometimes, can also have desirable and useful outcomes. Co-administration of Regulipid, a herbal formulation with diethylcarbamazine has been reported to decrease chyluria in patients with filariasis. In an experimental trial Liv100 - a herbal preparation has been reported to protect against hepatotoxic effects of antitubercular drugs isoniazid, rifampicin and pyrazinamide.

The published reports of interactions between Ayurvedic and allopathic drugs are just the tip of the iceberg. The actual incidence of such interactions is very high in our country which can be estimated from the facts: (1) More than 600 million people rely on Ayurvedic drugs who are more likely to combine their unsupervised use with prescription chemical drugs, (2) ‘Country’ medicines (desi dava i.e. unofficial preparations of Ayurveda or Unani or unknown category) are sold openly and the number of people who use them is also very large, (3) The incidence of adulteration of Ayurvedic drugs with allopathic drugs is very high as, more than 50 percent of Ayurvedic drugs and 60 percent of drugs of unknown category have been reported to be adulterated with corticosteroids, (4) Indications of Ayurvedic plants with no information about their adverse effects are highly advertised in media which further promote their unsupervised use with prescription chemical drugs, (5) Simultaneous prescribing of Ayurvedic and allopathic drugs by some doctors and practitioners of Indian System of Medicine can also result in interactions, (6) The reverse pharmacology path adopted for Ayurvedic drugs by the various research centers like ICMR, CSIR, DBT etc. can also lead to such interactions as, use of these drugs in patients is based on the rich biodiverse
phytopharmacological leads from Ayurveda with little information about their active principles, pharmacokinetics, pharmacodynamics, adverse reactions etc.\textsuperscript{21}

Thus, rational prescribing is not possible until and unless intersystem drugs interactions are prevented. ADR monitoring of Ayurvedic drugs, data collection of desirable intersystem drugs interactions are essential and useful informations must be imparted to medical graduates, postgraduates and medical practitioners. Free sale of unofficial Ayurvedic preparations should be prohibited. Good quality control of Ayurvedic drugs should be ensured to prevent their adulteration. But, the problem is which discipline should be made responsible for achieving the desired goals? It is also worthwhile to keep in view that proper monitoring of allopathic drugs have not become possible, so far. In present circumstances, suggestion of Vaidya et al of proposing Ayurvedic Pharmacoepidemiology as a New Discipline seems to be justified and with its proper functioning the desired objectives can be achieved.\textsuperscript{22}

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\textbf{Typhus Fever}

Sir,

Typhus fever caused by rickettsial infections are widespread in our country especially in hilly areas of HP, Uttarakhand Pradesh, Nepal, North East states and adjoining sub-mountain areas.

In 1973-74 there was a outbreak of unknown fever in valleys of Mandi Distt of HP where I was posted as medical specialist. After ruling out other causes of fever I considered "Typhus" and got Weil Felix test done for some blood samples at CRI, Kasauli. Titres were high in almost all cases and we labelled the fever as Typhus fever. Treatment with tetracycline was given and the results were as on expected lines.

We have been seeing these cases of fever every year since last thirty years during monsoon season. The disease can be diagnosed clinically in most of the cases from history, geographical area, season, rash on body, high fever with low pulse rate, body aches and malaise, lymphadenopathy etc. In some cases Weil Felix was done to confirm the diagnosis.

Recently there have been reports of fever of unknown origin (mysterious fever as reported in press) leading to considerable number of deaths during last two-three years. Indian Gandhi Medical College (IGMC), Shimla being tertiary care centre in the region has been dealing in such cases. No diagnosis could be arrived at this centre. IGMC had referred these cases to NICD, New Delhi, who also could not diagnose the fever. We were seeing these cases at our nursing home at
Solan, a district town in HP. We got some blood samples from IGMC, Shimla, tested for Weil Felix reaction along with our own samples. The test were positive for OXK - antigen in 1/250 to 1/125 dilutions (significantly positive titre). The matter was reported to medical authorities in IGMC, Shimla. The so called mysterious fever was diagnosed as scrub typhus caused by R-Tsutsugamushi. After my report, NICD-New Delhi visited the IGMC, Shimla and confirmed the findings.

Typhus fever is not an uncommon cause of fever, specially in the hilly areas of our country. I will like to draw the attention of medical fraternity to keep in mind typhus to be an important cause of fever.

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Docetaxel-induced Onycholysis
Sir,

Anthracycline and taxane chemotherapy is usually associated with skin and nail changes. Onycholysis is rare, but occurs in some patients. We present three cases of onycholysis who were being treated with weekly docetaxel.

Case 1
A 50 years old woman with carcinoma breast presented with pulmonary metastasis. She was started on docetaxel 40 mg/m2/week in November 2001. She developed onycholysis involving all fingernails and toenails (Fig. 1) after 6 weeks of chemotherapy in January 2001. Subsequently all finger and toe nails got completely detached from the nail bed. There was no pain or inflammation but only mild exudation from hyponychia. She voluntarily stopped further treatment. Patients was advised to protect her fingernails from sunlight. Onycholysis resolved after 2 months.

Case 2
A 26 years old woman presented with carcinoma breast with pulmonary metastasis. She was started on 40 mg/m2 of docetaxel every week in June 2001. She developed painless separation of all finger and toenails in September 2001. There was no inflammation around that area. Onycholysis started after 12 weeks of docetaxel. She developed brain metastasis and expired within a month.

Case 3
A 45 years old woman presented with carcinoma breast with lung and liver metastasis. She was refractory to adriamycin and was started on 40 mg/m2/week of docetaxel in December 2001. She had more than 50% regression in tumour mass with docetaxel treatment. She developed separation of all fingernails in February 2002 after six weeks of chemotherapy. No inflammation or pain was present. She was advised to protect her fingernails from sunlight. Onycholysis resolved despite continued docetaxel treatment.

Our observation confirms the earlier finding by Correa O et al, that docetaxel causes onycholysis with prolonged administration. One hundred and forty cases of chemotherapy-induced onycholysis have been reported in the literature. We have reported three cases in this paper. Onycholysis is commonly associated with anthracyclines and taxanes. In a study by Hussain et al, 32 patients had onycholysis and were given anthracyclines without taxanes. Among anthracyclines, doxorubicin caused onycholysis in 11, Mitoxantrone in 21, nine of them received only anthracyclines. Ninety five patients had onycholysis on taxanes, docetaxel was administered in seventy eight. Only three reports of onycholysis not associated with anthracyclines or taxanes has been reported. Two received etoposide and one 5-flurouracil. The first toe is the most common nail involved. Hussain et al reported twelve patients had involvement of all digits (fingers and toes) and multiple digits involved in 10 patients. The mean and median onset of onycholysis, were 12.1 weeks and 11.5 weeks, respectively (range, 1-33 weeks), but in many cases accurate data were lacking. Addition risk factors are the use of docetaxel, mitoxantrone alone or combined and prolonged weekly taxanes administration.1

Hussain S et al2 has reported an association of onycholysis with summer season due to sunlight exposure as many patients benefit from protecting their nails from sunlight. Systemic drugs cause subungual hyperkeratosis, reduced nail growth and splinter hemorrhages, which might be the cause of onycholysis. If appropriate care is taken...

Fig. 1: Bilateral foot showing separation of nails from nail beds with nail and skin pigmentation.
onycholysis is not a dose-limiting toxicity. Patients expected of having prolonged exposure to taxanes and anthracyclines or developing onycholysis, should be advised to avoid exposure of fingernails and toenails as well as skin to sunlight. Three cases developed onycholysis out of 42 cases of carcinoma breast who received docetaxel (10 patients received weekly docetaxel and 32 patients received three weekly schedule of docetaxel). These patients received docetaxel between January 2000 to December 2001. All the three cases that developed onycholysis received weekly docetaxel. None of the 32 cases who received three weekly docetaxel protocol developed onycholysis. It can be concluded that weekly docetaxel predisposes the patients to onycholysis. Morbidity due to onycholysis can be reduced if appropriate measures are taken at the earliest.

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Use of Sulfonylureas During Pregnancy:
Some Incidental Observations

Sir,

With the increase in life-span and sedentary lifestyle, prevalence of type 2 diabetes mellitus continues to increase in developing nations. Type 2 diabetes mellitus, which was considered to be a disease of adults is now seen at young age also. With increasing recognition of type 2 diabetes mellitus in young subjects also, there are many instances when females in the reproductive age would conceive while taking oral hypoglycemic agents. Lack of awareness about their teratogenic and other effects in patients and sometimes in primary care physicians and gynaecologists would increase the chances of such an occurrences. Despite the fact that use of sulfonylureas during pregnancy is presently not recommended, there have been reports of glyburide actually being recommended for the use as an oral hypoglycemic agent in gestational diabetes mellitus (GDM). In this report, we describe the outcome of 15 deliveries in 12 women who had consumed glyburide during pregnancy.

During the last five years, 12 female subjects with diabetes mellitus on glyburide had subsequently conceived and reported to our Endocrine Outpatient Clinic during pregnancy. Their name, age, type of diabetes mellitus, type of the sulfonylurea taken, dose of sulfonylurea taken and duration of sulfonylurea intake during pregnancy were noted. All these patients were started on insulin after stopping the oral drugs. Outcome of that particular pregnancy was noted. All these ladies were asked to deliver at the obstetric unit of the institute and both mother and the baby were reexamined after delivery. Baby was particularly screened for any congenital malformation.

In previous five years, 12 subjects were seen who had consumed various oral hypoglycemic agents during pregnancy. These 12 subjects had a total of 15 pregnancies. Out of 12 patients, 10 had type 2 diabetes. One each had fibrocalculous pancreatopathy and gestational diabetes mellitus. Table 1 gives the details of these subjects. During all these pregnancies, glyburide was consumed in various dosages and one patient had consumed tolbutamide. Age of these patients ranged from 22 to 40 years with a mean age 32 ± 5.12 years. Most of these subjects had consumed glyburide during the initial weeks of pregnancy. Out of 15 pregnancies, 12 were normal and there was no congenital malformation in the offspring. One subjects had a normal delivery but the neonate had bilateral hydrocele, which disappeared in next two months spontaneously. Two subjects had abortion during first trimester out of which one subject had previous history of recurrent abortions.

We report our experience with the use of sulfonylureas during 15 pregnancies in 12 women. These women had diabetes before conception and continued the same drugs during pregnancy for variable periods of time. All of these women were on sulfonylureas during the first trimester of organogenesis. In three pregnancies, sulfonylurea was continued till delivery. All these pregnancies except two had a normal neonatal outcome, out of which two had abortions (one having recurrent abortions) and third one gave birth to a male baby with bilateral hydrocele. The use of sulfonylurea during the pregnancy has been limited and there is scant data mostly from retrospective studies of small number of women having pregestational diabetes mellitus. In most of these studies, perinatal deaths and congenital abnormalities were seen more frequently. Proportion of infants with macrosomia was increased in few studies.

A significant variability has been observed in human placental transfer rates of sulfonylureas. It is believed that less fetal exposure may occur with second generation sulfonylureas. In a recent study, glyburide was given to women with gestational diabetes mellitus well after organogenesis and outcome was compared with those receiving insulin; no difference in fetal outcome and frequency of congenital malformations was seen. Furthermore, it was estimated that little if any glyburide reached the fetuses. In vitro studies have demonstrated no maternofetal or fetomaternal transfer of glyburide in full term placentas perfused immediately after delivery. The use of glyburide during pregnancy is still controversial, however, from our observations and evidence of some recent studies, it seems apparent that glyburide may be given safely during
gestational diabetes mellitus. Although studies have shown no maternofetal transfer of the drug, further work needs to be done before the use of sulfonylureas during pregnancy is recommended.

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Self Injection of Insecticide

Sir,

I read with interest the article by MK Sundarke, et al, about "self injection of insecticide." In that article, a case of 18-year-old nurse admitted with alleged history of pain in left hand following a self-injection of about 2 ml of insecticide (isopropoxyphenyl N-methyl carbamate) into the vein of dorsum of left hand was discussed. The above mentioned insecticide is marketed in India as 'BAYGON'. In the same article, it was mentioned that the patient did not manifest any systemic signs of OP poisoning at any time during the hospital stay. Surgical treatment (fasciotomy) was required to remove the necrotic tissue.

This case report is an example of carbamate poisoning as the compound belongs to this group rather than OP group.

Insecticidal poisons are usually classified into Organophosphorus (OP) compounds; Organochloro compounds (eg DDT, BC, Endrine); Carbamate - eg aldicarb (Temik), propoxur (Baygon), carbaryl (Savin), carbofuran (Furadan), methomyl (Lennate), triallate (Avadex); Herbicides (e.g., Paraquat) and Others.2-4

Carbamates (like organophosphates) are inhibitors of acetyl cholinesterase, but carbamylate the serine moiety at the active site instead of phosphorylation. This is a reversible type of binding and hence symptoms are less severe and of shorter duration. As a result, both morbidity and mortality are limited when compared to organophosphate poisoning.4 Carbamate insecticide carbamylate and inactivate acetyl cholinesterase leading to excessive accumulation of acetylcholine with muscarinic and nicotinic receptor stimulation. Two important differences distinguish carbamate from organophosphate toxicity (i) carbamate toxicity is typically short-lived. Spontaneous hydrolysis of the
carbamylated acetyl cholinesterase enzyme regenerates enzymatic activity, usually within 24 hours, (ii) carbamates produce little or no CNS toxicity because of their inability to penetrate the blood brain barrier and affect brain cholinesterase activity.1

In the management of carbamate poisoning, atropine is the mainstay of therapy. Pralidoxime is not recommended owing to the spontaneous regeneration of acetyl cholinesterase enzyme. However, in patients with signs and symptoms of organophosphate or carbamate toxicity, the use of pralidoxime is recommended unless organophosphate toxicity has definitively been excluded. If it is clear that the patient is having carbamate (Baygon) toxicity then pralidoxime should not be given.3 Particularly in carbaryl carbamate poisoning, oxime therapy leads to the production of a carbamylated oxime, which may be a more potent acetylcholinesterase inhibitor than carbaryl itself.4

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**Long Duration Priapism in Blast Crisis of Chronic Myeloid Leukemia**

Sir,

Priapism is a well-recognized complication in patients of haematological malignancy especially chronic myeloid leukemia (CML). It is well described in standard textbook of haematology either as a presenting feature or as a late complication. The role of immediate surgery is well recognized and routinely recommended. Failure to do so is an error of omission. This case highlights an important complication of delayed treatment in the form of impotency.

An eighteen-year-old boy presented to casualty with persistent, painful erection of penis of ten days duration. He was a diagnosed patient of CML and was undergoing chemotherapy with hydroxyurea (500 mg BD) and allopurinol for three weeks.

On examination the patient was anaemic and had hepatosplenomegaly. Local examination revealed enlarged penis of 18 cm in length, with turgid cavernosa and flaccid corpora spongiosum but with no ischaemic changes. Investigations revealed haemoglobin of 6.5 gm%, total leukocyte count of 3,20,000 and a normal platelet count. Renal and liver function test were normal. The patient was admitted and started on intravenous hydration, furosemide and sodium bicarbonate. The dose of hydroxyurea was escalated to 1 gm BD and allopurinol was continued in coordination with haematologist and medical oncologist. There was no response to priapism even after 48 hours of intensive chemotherapy regime. Leukopheresis could not be performed because of financial constraints. Winter’s shunt,1 a communication between the corpora cavernosa and the spongiosum was established under general anaesthesia with intermittent pneumatic compression using paediatric blood pressure cuff and sphygmomanometer in the immediate post-op. After 48 hours of surgery the penis was not completely flaccid and showed some amount of firmness because of fibrosis. Hematological remission occurred after ten days of intensive chemotherapy with addition of 6-mercaptopurine. At a follow up of three months the patient is impotent with an enlarged (8cm) and firm penis.

A prominent problem in such cases is represented by an excessive delay between onset of priapism and the initiation of medical and surgical treatment. The aim of the treatment is rapid cytoreduction with systemic chemotherapy or leukopheresis for the underlying leukemia and/or localized penile radiation.2 If priapism persists for few days, the corporal tissue becomes thickened, edematous and eventually fibrotic which eventually leads to impotency.2 Complete restoration of sexual potency in priapism following surgical relief within 6-12 hrs duration and a poor outcome after 3 days has been reported.3

The primary management in patients reporting after three days should be intensive cytoreductive chemotherapy followed by immediate surgery and intermittent pneumatic compression of the penis for 48 hrs after the surgery.

In our country where patients come from remote places, physicians treating patients of hematological malignancy should explain the possibility and consequences of priapism so that they can be managed early and successfully with no loss of impotency. Had our patient reported to the casualty at an early time, he could have been saved from the complication of impotency. Priapism is a surgical emergency and treatment demands proper coordination between the urologist, haematologist and medical oncologist.

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